Andreas Haeberlen

June 13, 2017

Department of Computer and Information Science
University of Pennsylvania
3330 Walnut Street
Philadelphia, PA 19104, USA

Phone: +1 (215) 746-6167
Email: ahae@cis.upenn.edu
Web: http://www.cis.upenn.edu/∼ahae/
Citizenship: USA, Germany

Research Interests

Distributed systems, networking, security, privacy

Education

Ph.D. in Computer Science May 2009
Rice University
Advisor: Peter Druschel

Dipl. inform. in Computer Science April 2003
University of Karlsruhe, Germany
Advisor: Jochen Liedtke

Academic Positions Held

Associate Professor July 2016 – present
University of Pennsylvania, Philadelphia, PA
Department of Computer and Information Science

Raj and Neera Singh Assistant Professor January 2010 – June 2016
University of Pennsylvania, Philadelphia, PA
Department of Computer and Information Science

Postdoctoral Researcher May 2009 – December 2009
Max Planck Institute for Software Systems, Saarbrücken, Germany

Honors & Distinctions

- Ford Motor Company Award for Faculty Advising, University of Pennsylvania, 2016
- CAREER award, National Science Foundation, 2011
- Otto Hahn Medal (for outstanding scientific achievements), Max Planck Society, 2010
- SAP Award, University of Karlsruhe, 2003
- Graduated with Distinction, University of Karlsruhe, 2003
- Teaching Award, University of Karlsruhe, 2002
- Scholarship, IBM Germany, 2000 – 2003
- Jubilee State Foundation Award, University of Karlsruhe, 2000

Publications

Note: Acceptance rates are in parentheses; citation numbers are based on Google Scholar, and are shown for papers with at least ten citations. **Seven papers have been cited more than 100 times.**

Journal Publications

1. M. Zhao, W. Zhou, A. Gurney, **A. Haeberlen**, M. Sherr, and B. T. Loo. *Private and Verifiable Interdomain Routing Decisions.* IEEE/ACM Transactions on Networking (ToN), 24(2):1011–1024, Apr. 2016. 14 pages.
2. W. Zhou, S. Mapara, Y. Ren, Y. Li, **A. Haeberlen**, Z. Ives, B. T. Loo, and M. Sherr. *Distributed Time-Aware Provenance.* Proc. VLDB Endowment, 6(2):49–60, Dec. 2012. 12 pages, 17 citations.
3. **A. Haeberlen**. *A Case for the Accountable Cloud.* ACM SIGOPS Operating Systems Review, 44(2):52–57, Apr. 2010. 6 pages, **148 citations**.

Peer-Reviewed Conference Publications

4. D. Winograd-Cort, **A. Haeberlen**, A. Roth, and B. C. Pierce. *A Framework for Adaptive Differential Privacy.* Proceedings of the 22nd ACM SIGPLAN International Conference on Functional Programming (ICFP'17), Oxford, United Kingdom, September 2017 (35%). 24 pages.
5. A. Papadimitriou, A. Narayan, and **A. Haeberlen**. *DStress: Efficient Differentially Private Computations on Distributed Data.* Proceedings of the 12th European Conference on Computer Systems (EuroSys'17), Belgrade, Serbia, April 2017 (20%). 14 pages.
6. A. Chen, **A. Haeberlen**, W. Zhou, and B. T. Loo. *One Primitive to Diagnose Them All: Architectural Support for Internet Diagnostics.* Proceedings of the 12th European Conference on Computer Systems (EuroSys'17), Belgrade, Serbia, April 2017 (20%). 14 pages.
7. Y. Wu, A. Chen, **A. Haeberlen**, W. Zhou, and B. T. Loo. *Automated Bug Removal for Software-Defined Networks.* Proceedings of the 14th USENIX Symposium on Networked Systems Design and Implementation (NSDI'17), Boston, MA, March 2017 (18%). 15 pages.
8. A. Chen, Y. Wu, **A. Haeberlen**, B. T. Loo, and W. Zhou. *Data Provenance at Internet Scale: Architecture, Experiences, and the Road Ahead.* Proceedings of the 8th Conference on Innovative Data Systems Research (CIDR'17), Chaminade, CA, January 2017. 6 pages.
9. A. Papadimitriou, R. Bhagwan, N. Chandran, R. Ramjee, **A. Haeberlen**, H. Singh, A. Modi, and S. Badrinarayanan. *Big Data Analytics over Encrypted Datasets with Seabed.* Proceedings of the 12th USENIX Symposium on Operating Systems Design and Implementation (OSDI'16), Savannah, GA, November 2016 (18%). 12 pages.
10. A. Chen, Y. Wu, **A. Haeberlen**, W. Zhou, and B. T. Loo. *The Good, the Bad, and the Differences: Better Network Diagnostics with Differential Provenance.* Proceedings of the ACM SIGCOMM Conference (SIGCOMM'16), Florianópolis, Brazil, August 2016 (17%). 12 pages.
11. A. Narayan, A. Feldman, A. Papadimitriou, and **A. Haeberlen**. *Verifiable Differential Privacy.* Proceedings of the 10th European Conference on Computer Systems (EuroSys'15), Bordeaux, France, April 2015 (21%). 14 pages.
12. A. Chen, W. B. Moore, H. Xiao, **A. Haeberlen**, L. T. X. Phan, M. Sherr, and W. Zhou. *Detecting Covert Timing Channels with Time-Deterministic Replay.* Proceedings of the 11th USENIX Symposium on Operating Systems Design and Implementation (OSDI'14), Broomfield, CO, October 2014 (18%). 14 pages.

13. Y. Wu, M. Zhao, **A. Haeberlen**, W. Zhou, and B. T. Loo. *Diagnosing Missing Events in Distributed Systems with Negative Provenance*. Proceedings of the ACM SIGCOMM Conference (SIGCOMM'14), Chicago, IL, August 2014 (19%). 12 pages.
14. J. Hsu, M. Gaboardi, **A. Haeberlen**, S. Khanna, A. Narayan, B. C. Pierce, and A. Roth. *Differential Privacy: An Economic Method for Choosing Epsilon*. Proceedings of the IEEE Computer Security Foundations Symposium (CSF'14), Vienna, Austria, July 2014 (35%). 13 pages, 25 citations.
15. M. Zhao, P. Aditya, A. Chen, Y. Lin, **A. Haeberlen**, P. Druschel, B. Maggs, W. Wishon, and M. Ponec. *Peer-Assisted Content Distribution in Akamai NetSession*. Proceedings of the 13th ACM SIGCOMM Internet Measurement Conference (IMC'13), Barcelona, Spain, October 2013 (24%). 12 pages, 31 citations.
16. J. Chang, P. Gebhard, **A. Haeberlen**, Z. Ives, I. Lee, O. Sokolsky, K. Venkatasubramanian. *TrustForge: Flexible Access Control for Collaborative Crowd-Sourced Environment*. Proceedings of the 11th Annual Conference on Privacy, Security, and Trust (PST'13), Tarragona, Spain, July 2013. 10 pages.
17. M. Gaboardi, **A. Haeberlen**, J. Hsu, A. Narayan, B. C. Pierce. *Linear Dependent Types for Differential Privacy*. Proceedings of the 40th ACM SIGPLAN-SIGACT Symposium on Principles of Programming Languages (POPL'13), Rome, Italy, January 2013 (18%). 14 pages, 45 citations.
18. W. Zhou, S. Mapara, Y. Ren, Y. Li, **A. Haeberlen**, Z. Ives, B. T. Loo, and M. Sherr. *Distributed Time-Aware Provenance*. Presented at the 39th International Conference on Very Large Data Bases (VLDB'13), Trento, Italy, August 2013 (see journal publications). 12 pages, 17 citations.
19. A. Narayan and **A. Haeberlen**. *DJoin: Differentially Private Join Queries over Distributed Databases*. Proceedings of the 10th USENIX Symposium on Operating Systems Design and Implementation (OSDI'12), Hollywood, CA, October 2012 (12%). 14 pages, 23 citations.
20. M. Zhao, W. Zhou, A. Gurney, **A. Haeberlen**, M. Sherr, and B. T. Loo. *Private and Verifiable Interdomain Routing Decisions*. Proceedings of the ACM SIGCOMM Conference (SIGCOMM'12), Helsinki, Finland, August 2012 (14%). 12 pages, 33 citations.
21. P. Aditya, M. Zhao, Y. Lin, **A. Haeberlen**, P. Druschel, B. Maggs, and W. Wishon. *Reliable Client Accounting for Hybrid Content-Distribution Networks*. Proceedings of the 9th USENIX Symposium on Networked Systems Design and Implementation (NSDI'12), San Jose, CA, April 2012 (18%). 14 pages, 22 citations.
22. W. Zhou, Q. Fei, A. Narayan, **A. Haeberlen**, B. T. Loo, and M. Sherr. *Secure Network Provenance*. Proceedings of the 23rd ACM Symposium on Operating Systems Principles (SOSP'11), Cascais, Portugal, October 2011 (18%). 16 pages, 34 citations. Extended version available as TR MS-CIS-11-14.
23. **A. Haeberlen**, B. C. Pierce, and A. Narayan. *Differential Privacy Under Fire*. Proceedings of the 20th USENIX Security Symposium (USENIX Security'11), San Francisco, CA, August 2011 (17%). 15 pages, 63 citations.
24. **A. Haeberlen**, P. Aditya, R. Rodrigues, and P. Druschel. *Accountable Virtual Machines*. Proceedings of the 9th USENIX Symposium on Operating Systems Design and Implementation (OSDI'10), Vancouver, Canada, October 2010 (16%). 16 pages, 73 citations.
25. **A. Haeberlen** and P. Kuznetsov. *The Fault Detection Problem*. Proceedings of the 13th International Conference on Principles of Distributed Systems (OPODIS'09), Nîmes, France, December 2009 (32%). 15 pages, 23 citations.
26. **A. Haeberlen**, I. Avramopoulos, J. Rexford, and P. Druschel. *NetReview: Detecting when Interdomain Routing Goes Wrong*. Proceedings of the 6th USENIX Symposium on Networked Systems Design and Implementation (NSDI'09), Boston, MA, April 2009 (20%). 16 pages, 46 citations.

27. M. Backes, P. Druschel, **A. Haeberlen**, and D. Unruh. *CSAR: A Practical and Provable Technique to Make Randomized Systems Accountable*. Proceedings of the 16th Annual Network & Distributed System Security Symposium (NDSS'09), San Diego, CA, February 2009 (12%). 13 pages, 29 citations. Extended version available as technical report MPI-SWS-2008-002.
28. M. Dischinger, A. Mislove, **A. Haeberlen**, and K. Gummadi. *Detecting BitTorrent Blocking*. Proceedings of the 8th ACM SIGCOMM Internet Measurement Conference (IMC'08), Vouliagmeni, Greece, October 2008 (17%). 6 pages, **103 citations**.
29. M. Dischinger, **A. Haeberlen**, I. Beschastnikh, K. Gummadi, and S. Saroiu. *SatelliteLab: Adding Heterogeneity to Planetary-Scale Network Testbeds*. Proceedings of the ACM SIGCOMM Conference (SIGCOMM'08), Seattle, WA, August 2008 (13%). 12 pages, 38 citations.
30. **A. Haeberlen**, P. Kuznetsov, and P. Druschel. *PeerReview: Practical Accountability for Distributed Systems*. Proceedings of the 21st ACM Symposium on Operating Systems Principles (SOSP'07), Stevenson, WA, October 2007 (19%). 14 pages, **283 citations**. Extended version available as technical report MPI-SWS-2007-003.
31. M. Dischinger, **A. Haeberlen**, K. Gummadi, and S. Saroiu. *Characterizing Residential Broadband Networks*. Proceedings of the 7th ACM SIGCOMM Internet Measurement Conference (IMC'07), San Diego, CA, October 2007 (29%). 14 pages, **339 citations**.
32. **A. Haeberlen**, M. Dischinger, K. Gummadi, and S. Saroiu. *Monarch: A Tool to Emulate Transport Protocol Flows over the Internet at Large*. Proceedings of the 6th ACM SIGCOMM Internet Measurement Conference (IMC'06), Rio de Janeiro, Brazil, October 2006 (22%). 14 pages, 22 citations.
33. B.-G. Chun, F. Dabek, **A. Haeberlen**, E. Sit, H. Weatherspoon, M. F. Kaashoek, J. Kubiatowicz, and R. Morris. *Efficient Replica Maintenance for Distributed Storage Systems*. Proceedings of the 3rd USENIX Symposium on Networked Systems Design and Implementation (NSDI'06), San Jose, CA, May 2006 (25%). 14 pages, **251 citations**.
34. A. Mislove, A. Post, **A. Haeberlen**, and P. Druschel. *Experiences in Building and Operating ePOST, a Reliable Peer-to-Peer Application*. Proceedings of the 1st European Conference on Computer Systems (EuroSys'06), Leuven, Belgium, April 2006 (20%). 13 pages, 61 citations.
35. **A. Haeberlen**, A. Mislove, and P. Druschel. *Glacier: Highly Durable, Decentralized Storage Despite Massive Correlated Failures*. Proceedings of the 2nd USENIX Symposium on Networked Systems Design and Implementation (NSDI'05), Boston, MA, May 2005 (22%). 16 pages, **266 citations**.
36. **A. Haeberlen**, E. Flannery, A. Ladd, A. Rudys, D. Wallach, and L. Kavraki. *Practical Robust Localization over Large-Scale 802.11 Wireless Networks*. Proceedings of the 10th ACM International Conference on Mobile Computing and Networking (MOBICOM'04), Philadelphia, PA, September 2004 (8%). 13 pages, **631 citations**.
37. **A. Haeberlen** and K. Elphinstone. *User-level Management of Kernel Memory*. Proceedings of the 8th Asia-Pacific Computer Systems Architecture Conference (ACSAC'03), Aizu-Waikamatsu City, Japan, September 2003. 13 pages, 27 citations.

Peer-Reviewed Workshop Publications

38. A. Chen, A. Sriraman, T. Vaidya, Y. Zhang, **A. Haeberlen**, B. T. Loo, L. T. X. Phan, M. Sherr, C. Shields, and W. Zhou. *Dispersing Asymmetric DDoS Attacks with SplitStack*. Proceedings of the 15th ACM Workshop on Hot Topics in Networks (HotNets'16), Atlanta, GA, November 2016 (28%). 7 pages.
39. H. Nguyen, B. Acharya, R. Ivanov, **A. Haeberlen**, L. T. X. Phan, O. Sokolsky, J. Walker, J. Weimer, C. W. Hanson, and I. Lee. *Cloud-Based Secure Logger for Medical Devices*. Proceedings of the 1st International Workshop on Security, Privacy, and Trustworthiness in Medical Cyber-Physical Systems (MedSPT'16), Washington, DC, June 2016. 7 pages.

40. Y. Wu, A. Chen, **A. Haeberlen**, W. Zhou, and B. T. Loo. *Automated Network Repair with Meta Provenance.* Proceedings of the 14th ACM Workshop on Hot Topics in Networks (HotNets'15), Philadelphia, PA, November 2015 (18%). 7 pages.
41. A. Chen, Y. Wu, **A. Haeberlen**, W. Zhou, and B. T. Loo. *Differential Provenance: Better Network Diagnostics with Reference Events.* Proceedings of the 14th ACM Workshop on Hot Topics in Networks (HotNets'15), Philadelphia, PA, November 2015 (18%). 7 pages.
42. A. Chen and **A. Haeberlen**. *PRISM: Private Retrieval of the Internet's Sensitive Metadata.* Proceedings of the 8th Workshop on Cyber Security Experimentation and Test (CSET'15), Washington, DC, August 2015 (31%). 8 pages.
43. A. Chen, H. Xiao, **A. Haeberlen**, and L. T. X. Phan. *Fault Tolerance and the Five-Second Rule.* Proceedings of the 15th Workshop on Hot Topics in Operating Systems (HotOS'15), Ittingen, Switzerland, May 2015 (32%). 7 pages.
44. A. Narayan, A. Papadimitriou, and **A. Haeberlen**. *Compute Globally, Act Locally: Protecting Federated Systems from Systemic Threats.* Proceedings of the 10th Workshop on Hot Topics in System Dependability (HotDep'14), Broomfield, CO, October 2014. 6 pages.
45. A. Bates, K. Butler, **A. Haeberlen**, M. Sherr, and W. Zhou. *Let SDN Be Your Eyes: Secure Forensics in Data Center Networks.* Proceedings of the NDSS Workshop on Security of Emerging Network Technologies (SENT'14), San Diego, CA, February 2014. 6 pages.
46. Y. Wu, **A. Haeberlen**, W. Zhou, and B. T. Loo. *Answering Why-Not Queries in Software-Defined Networks with Negative Provenance.* Proceedings of the 12th ACM Workshop on Hot Topics in Networks (HotNets'13), College Park, MD, November 2013 (23%). 6 pages.
47. A. Papadimitriou, M. Zhao, and **A. Haeberlen**. *Towards Privacy-Preserving Fault Detection.* Proceedings of the 9th Workshop on Hot Topics in System Dependability (HotDep'13), Farmington, PA, November 2013 (52%). 6 pages.
48. L. D'Antoni, M. Gaboardi, E. Gallego, **A. Haeberlen**, and B. C. Pierce. *Sensitivity Analysis using Type-Based Constraints.* Proceedings of the Workshop on Functional Programming Concepts in Domain-Specific Languages (FPCDSL'13), Boston, MA, September 2013. 6 pages.
49. Z. Ives, **A. Haeberlen**, T. Feng, and W. Gatterbauer. *Querying Provenance for Ranking and Recommending.* Proceedings of the 4th USENIX Workshop on the Theory and Practice of Provenance (TaPP'12), Boston, MA, June 2012. 4 pages.
50. A. Gurney, **A. Haeberlen**, W. Zhou, M. Sherr, and B. T. Loo. *Having Your Cake and Eating It Too: Routing Security with Privacy Protections.* Proceedings of the 10th ACM Workshop on Hot Topics in Networks (HotNets'11), Cambridge, MA, November 2011 (20%). 6 pages, 11 citations.
51. A. Aviv and **A. Haeberlen**. *Challenges in Experimenting with Botnet Detection Systems.* Proceedings of the 4th Workshop on Cyber Security Experimentation and Test (CSET'11), San Francisco, CA, August 2011 (39%). 8 pages, 27 citations.
52. W. Zhou, L. Ding, **A. Haeberlen**, Z. Ives, and B. T. Loo. *TAP: Time-Aware Provenance for Distributed Systems.* Proceedings of the 3rd USENIX Workshop on the Theory and Practice of Provenance (TaPP'11), Heraklion, Greece, June 2011. 6 pages, 11 citations.
53. W. Zhou, Q. Fei, **A. Haeberlen**, B. T. Loo, and M. Sherr. *Towards Self-Explaining Networks.* Proceedings of the NEBULA Workshop, Philadelphia, PA, June 2011. 6 pages.
54. J. Reed, A. Aviv, D. Wagner, **A. Haeberlen**, B. C. Pierce, and J. Smith. *Differential Privacy for Collaborative Security.* Proceedings of the European Workshop on System Security (EuroSec'10), Paris, France, April 2010 (33%). 7 pages, 27 citations.

55. **A. Haeberlen**, R. Rodrigues, K. Gummadi, and P. Druschel. *Pretty Good Packet Authentication.* Proceedings of the 4th Workshop on Hot Topics in System Dependability (HotDep'08), San Diego, CA, December 2008 (42%). 5 pages, 12 citations.
56. **A. Haeberlen**, P. Kuznetsov, and P. Druschel. *The Case for Byzantine Fault Detection.* Proceedings of the 2nd Workshop on Hot Topics in System Dependability (HotDep'06), Seattle, WA, November 2006 (27%). 6 pages, 57 citations. Extended version available as technical report MPI-SWS-2006-001.
57. E. Sit, **A. Haeberlen**, F. Dabek, B.-G. Chun, H. Weatherspoon, R. Morris, and M. F. Kaashoek. *Proactive Replication for Data Durability.* Proceedings of the 5th International Workshop on Peer-to-Peer Systems (IPTPS'06), Santa Barbara, CA, February 2006 (27%). 6 pages, 89 citations.
58. **A. Haeberlen**, A. Mislove, A. Post, and P. Druschel. *Fallacies in Evaluating Decentralized Systems.* Proceedings of the 5th International Workshop on Peer-to-Peer Systems (IPTPS'06), Santa Barbara, CA, February 2006 (27%). 6 pages, 47 citations.
59. **A. Haeberlen**, J. Liedtke, Y. Park, L. Reuther, and V. Uhlig. *Stub-Code Performance is Becoming Important.* Proceedings of the 1st Workshop on Industrial Experiences with Systems Software (WIESS'00), San Diego, CA, October 2000. 8 pages, 32 citations.

Book chapters

60. T. Anderson, K. Birman, R. Broberg, M. Caesar, D. Comer, C. Cotton, M. Freedman, **A. Haeberlen**, Z. Ives, A. Krishnamurthy, W. Lehr, B. T. Loo, D. Mazières, A. Nicolosi, J. Smith, I. Stoica, R. van Renesse, M. Walfish, H. Weatherspoon, and C. Yoo. *The NEBULA Future Internet Architecture.* In: A. Galis and A. Gavras (Ed.), Future Internet Assembly 2013. Lecture Notes in Computer Science (LNCS) 7858, Springer, 2013. 11 pages.
61. A. Mislove, **A. Haeberlen**, A. Post, and P. Druschel. *ePOST.* In: R. Steinmetz and K. Wehrle (Ed.), Peer-to-Peer Systems and Applications. Lecture Notes in Computer Science (LNCS) 3485, Springer, 2005. 22 pages.

Technical reports

62. **A. Haeberlen**, P. Fonseca, R. Rodrigues, and P. Druschel. *Fighting Cybercrime with Packet Attestation.* Max Planck Institute for Software Systems Technical Report MPI-SWS-2011-002, July 2011. 14 pages.
63. W. Zhou, **A. Haeberlen**, B. T. Loo, and M. Sherr. *Tracking Adversarial Behavior in Distributed Systems with Secure Network Provenance.* University of Pennsylvania Department of Computer and Information Science Technical Report MS-CIS-10-28, August 2010. 6 pages.
64. **A. Haeberlen**, J. Hoye, A. Mislove, and P. Druschel. *Consistent Key Mapping in Structured Overlays.* Rice University Department of Computer Science Technical Report TR05-456, August 2005. 6 pages, 19 citations.
65. V. Uhlig, U. Dannowski, E. Skoglund, **A. Haeberlen**, and G. Heiser. *Performance of Address-Space Multiplexing on the Pentium.* University of Karlsruhe Department of Computer Science Technical Report 2002-1, May 2002. 15 pages, 29 citations.

Other publications

66. S. Badrinarayanan, R. Bhagwan, N. Chandran, **A. Haeberlen**, A. Modi, A. Papadimitriou, R. Ramjee, H. Singh, and N. Sood. *Seabed: Big Data Analytics over Encrypted Datasets.* Demo; appeared in Proceedings of the 9th International Conference on Communication Systems & Networks (COMSNETS'17), Bengaluru, India, January 2017. 2 pages.

67. **A. Haeberlen**, M. Zhao, W. Zhou, A. Gurney, M. Sherr, and B. T. Loo. *Privacy-Preserving Collaborative Verification Protocols.* Invited paper; appeared in Proceedings of the 6th Workshop on Large-Scale Distributed Systems and Middleware (LADIS'12), Madeira, Portugal, July 2012. 2 pages.
68. W. Zhou, Q. Fei, S. Sun, T. Tao, **A. Haeberlen**, Z. Ives, B. T. Loo, and M. Sherr. *NetTrails: A Declarative Platform for Maintaining and Querying Provenance in Distributed Systems.* Demo; appeared in Proceedings of the ACM SIGMOD International Conference on Management of Data (SIGMOD'11), Athens, Greece, June 2011. 3 pages, 10 citations.
69. U. Dannowski, K. Elphinstone, J. Liedtke, G. Liefländer, E. Skoglund, V. Uhlig, C. Ceelen, **A. Haeberlen**, and M. Völp. *The L4Ka Vision.* White paper, Apr. 2001. 8 pages, 18 citations.

Posters

70. Y. Wu, **A. Haeberlen**, W. Zhou, and B. T. Loo. *Answering Why-Not Queries in Software-Defined Networks with Negative Provenance.* Presented at the 24th ACM Symposium on Operating Systems Principles (SOSP'13), Farmington, PA, November 2013.
71. A. Papadimitriou, M. Zhao, and **A. Haeberlen**. *Fault Detection with Privacy Guarantees.* Presented at the 24th ACM Symposium on Operating Systems Principles (SOSP'13), Farmington, PA, November 2013.
72. A. Chen and **A. Haeberlen**. *PRISM: Private Retrieval of the Internet's Sensitive Metadata.* Presented at the 24th ACM Symposium on Operating Systems Principles (SOSP'13), Farmington, PA, November 2013.
73. M. Zhao, W. Zhou, A. Gurney, **A. Haeberlen**, M. Sherr, and B. T. Loo. *Collaborative Verification with Privacy Guarantees.* Presented at the 10th USENIX Symposium on Operating Systems Design and Implementation (OSDI'12), Hollywood, CA, October 2012.
74. W. Zhou, Q. Fei, A. Narayan, **A. Haeberlen**, B. T. Loo, and M. Sherr. *Secure Forensics Without Trusted Components.* Presented at the 8th USENIX Symposium on Networked Systems Design and Implementation (NSDI'11), Boston, MA, April 2011.
75. **A. Haeberlen**, R. Rodrigues, and P. Druschel. *Accountable Virtual Machines.* Presented at the 5th USENIX Symposium on Networked Systems Design and Implementation (NSDI'08), San Francisco, CA, April 2008.
76. **A. Haeberlen**, M. Dischinger, I. Beschastnikh, and K. Gummadi. *SatelliteLab: Adding Heterogeneity to Planetary-Scale Testbeds.* Presented at the 21st ACM Symposium on Operating Systems Principles (SOSP'07), Stevenson, WA, October 2007.
77. M. Dischinger, **A. Haeberlen**, K. Gummadi, and S. Saroiu. *Residential Broadband Networks: Characteristics and Implications.* Presented at the 4th USENIX Symposium on Networked Systems Design and Implementation (NSDI'07), Cambridge, MA, April 2007.

Theses

78. *Accountability for Distributed Systems*
Ph.D. Thesis, Rice University, April 2009.
79. *Managing Kernel Memory Resources from User Level*
Diplomarbeit, University of Karlsruhe, April 2003.
80. *Using Platform-Specific Optimizations in Stub-Code Generation*
Studienarbeit, University of Karlsruhe, July 2002.

Grants

Current Grants

1. J. Smith, **A. Haeberlen**, L. T. X. Phan, B. T. Loo, A. DeHon. *ProNet: Programmable Networks Enabled by Fast In-Path Analytics.* DARPA Dispersed Computing (DCOMP) program, $12,599,857 (Penn: $1.7M), 02/2017–01/2021.
2. B. T. Loo (PI), **A. Haeberlen**, L. T. X. Phan, M. Sherr, C. Shields, and W. Zhou. *DeDOS: Declarative Dispersion-Oriented Software.* DARPA Extreme DDoS Defense (XD3) program, $3,500,000, 06/2016–06/2019.
3. L. T. X. Phan (PI), **A. Haeberlen**, and B. T. Loo. *Network Functions Virtualization With Timing Guarantees.* NSF Networking Technology and Systems (NeTS) program, $1,100,000, 09/2016–08/2020.
4. A. Roth (PI), **A. Haeberlen**, and B. C. Pierce. *Distributed Differential Privacy.* NSF Secure and Trustworthy Cyberspace (SaTC) program, $1,200,000, 09/2015–08/2019.
5. S. Beitzel (PI), S. Alexander, A. Ghetie, G. Frazier, B. Williams, J. Smith, **A. Haeberlen**, B. T. Loo, , N. Duffield. *DEDUCE: Distributed Enclave Defense Using Configurable Edges.* DARPA Edge-Directed Cyber Technologies for Reliable Mission Control (EdgeCT) program, $1,173,000, 07/2015–06/2018.
6. I. Lee (PI), **A. Haeberlen**, N. Heninger, G. Pappas, O. Sokolsky, K. Shin, and M. Pajic. *Security and Privacy-Aware Cyber-Physical Systems.* NSF/Intel Partnership on Cyber-Physical Systems Security and Privacy (CPS-Security) program, $2,242,000, 09/2015–08/2018.
7. P. Yushkevich (PI), H. Wang, D. Wolk, K. Davis, R. Gorman, J. Detre, B. Avants, R. Shinohara, W. Witschey, and **A. Haeberlen**. *Adaptive Large-Scale Framework for Automatic Biometical Image Segmentation.* NIH R01 program, $3,517,000, 07/2014–06/2019.
8. **A. Haeberlen** (PI). *Evidence in Federated Distributed Systems.* NSF CAREER award, $508,636, 09/2011–01/2018.
9. **A. Haeberlen** (PI), Z. Ives, B. T. Loo, M. Sherr. *Tracking Adversarial Behavior in Distributed Systems with Secure Networked Provenance.* NSF Trustworthy Computing (TC) program, $845,000, 09/2011–08/2017.

Past Grants

10. B. C. Pierce (PI), **A. Haeberlen**, and A. Roth. *Putting Differential Privacy to Work.* NSF Trustworthy Computing (TC) program, $1,199,950, 03/2011–02/2017.
11. **A. Haeberlen** (PI). *Private Queries on Distributed Data Sets.* Google Research Award, $68,000, 02/2015–01/2016.
12. A. DeHon (PI), J. Smith, M. Blaze, S. Zdancewic, **A. Haeberlen**, and B. C. Pierce. *Safety on Untrusted Network Devices.* DARPA Mission-oriented Resilient Clouds (MRC) program, $771,000, 09/2011–09/2015.
13. J. Smith (PI), B. C. Pierce, **A. Haeberlen**, and S. Davidson. *Networks Opposing Botnets (NoBot) Phase II.* ONR, $1,800,000, 07/2012–06/2015.
14. **A. Haeberlen**. Gift from Facebook, $25,000, 06/2013.
15. K. Birman, M. Caesar, D. Comer, M. Freedman, **A. Haeberlen**, Z. Ives, A. Krishnamurthy, W. Lehr, B. T. Loo, D. Mazières, A. Nicolosi, R. van Renesse, J. Smith (PI), I. Stoica, M. Walfish, H. Weatherspoon, and C. Yoo. *A Future Internet That Supports Trustworthy Cloud Computing.* NSF Future Internet Architecture (FIA) program, $1,724,000, 09/2010–06/2015.
16. O. Sokolsky (PI), I. Lee, Z. Ives, and **A. Haeberlen**. *TrustForge: Flexible Access Control for VehicleForge Collaborative Environment.* DARPA Vehicleforge.mil program, $1,026,000, 08/2010–08/2013.

17. Z. Ives (PI), S. Guha, **A. Haeberlen**, M. Kearns, and A. Roth. *Enabling the Next Generation of Highly Dynamic, Inter-Domain Data-Centric Markets and Systems.* Gift from Google, $433,333, 07/2013–12/2014.

Presentations

Invited Talks

Accountability for Distributed Systems

1. Temple University, Oct. 2016
2. University of Maryland, College Park, Apr. 2016
3. Max Planck Institute for Software Systems, Apr. 2016
4. University of Southern California, Mar. 2016
5. Washington University in St. Louis, Mar. 2016
6. Cornell University, Feb. 2015
7. Rice University, Nov. 2014
8. UT Austin, Nov. 2014

Differentially Private Join Queries over Distributed Databases

9. DIMACS Workshop on Differential Privacy, Oct. 2012

Privacy and Forensics in Federated Distributed Systems

10. Max Planck Institute for Software Systems, Jun. 2010

Accountability for Distributed Systems

11. Duke University, Jun. 2010

The Accountable Cloud

12. InfraGard / Deloitte Cloud & Virtualization Symposium, Apr. 2010

Accountability for Distributed Systems

13. Microsoft Research Redmond, May 2009
14. ETH Zürich, Apr. 2009
15. Microsoft Research Silicon Valley, Apr. 2009
16. Microsoft Research Cambridge, Apr. 2009
17. New York University, Apr. 2009
18. Cornell University, Mar. 2009
19. University of Pennsylvania, Mar. 2009
20. UCLA, Mar. 2009
21. Deutsche Telekom Laboratories Berlin, Nov. 2008

PeerReview: Detecting Faulty Behavior in Distributed Systems

22. Dresden University of Technology, Dresden, Germany, Jan. 2006
23. UCSD, Sep. 2006

Paging the Kernel

24. University of New South Wales, Sydney, Australia, Oct. 2002
25. Dresden University of Technology, Dresden, Germany, Nov. 2002

Conference and Workshop Presentations

26. *Fault Tolerance and the Five-Second Rule*
    HotOS Workshop, May 2015
27. *The Enemy Within*
    NSF Workshop on Cyber-Physical Systems, Mar. 2013

28. *Privacy-Preserving Collaborative Verification Protocols*
    LADIS Workshop, Jul. 2012
29. *Having your Cake and Eating it too: Routing Security with Privacy Protections*
    HotNets workshop, Nov. 2011
30. *Differential Privacy Unver Fire*
    USENIX Security Symposium, Aug. 2011
31. *Towards Self-Explaining Networks*
    NEBULA workshop, Jul. 2011
32. *Accountable Virtual Machines*
    USENIX Symposium on Operating Systems Design and Implementation (OSDI'10), Oct. 2010
33. *The Fault Detection Problem*
    Workshop on Theory and Practice of Byzantine Fault Tolerance (BFTW^3), Sep. 2009
34. *NetReview: Detecting When Interdomain Routing Goes Wrong*
    USENIX Symposium on Networked Systems Design and Implementation (NSDI'09), Apr. 2009
35. *SatelliteLab: Adding Heterogeneity to Planetary-Scale Network Testbeds*
    ACM SIGCOMM Conference, Aug. 2008
36. *PeerReview: Practical Accountability for Distributed Systems*
    ACM Symposium on Operating Systems Principles (SOSP'07), Oct. 2007
37. *Practical Accountability for Distributed Systems*
    Workshop on Future Directions in Distributed Computing (FuDiCo III), Jun. 2007
38. *The Case for Byzantine Fault Detection*
    Workshop on Hot Topics in System Dependability (HotDep'06), Nov. 2006
39. *Monarch: A Tool to Emulate Transport Protocol Flows over the Internet at Large*
    ACM/USENIX Internet Measurement Conference (IMC'06), Oct. 2006
40. *Fallacies in Evaluating Decentralized Systems*
    International Workshop on Peer-to-Peer Systems (IPTPS'06), Feb. 20067
41. *Glacier: Highly Durable, Decentralized Storage Despite Massive Correlated Failures*
    USENIX Symposium on Networked Systems Design and Implementation (NSDI'06), May 2005
42. *Practical Robust Localization over Large-Scale 802.11 Wireless Networks*
    ACM International Conference on Mobile Computing and Networking (MOBICOM'04), Sep. 2004
43. *User-level Management of Kernel Memory*
    Asia-Pacific Computer Systems Architecture Conference (ACSAC'03), Sep. 2003
44. *Stub-Code Performance is Becoming Important*
    Workshop on Industrial Experiences with Systems Software (WIESS'00), Oct. 2000

Teaching Experience

Instructor, University of Pennsylvania

- CIS 455/555: Internet and Web Systems (Spring 2017)
  89 students. Course quality: 3.33/4, Instructor: 3.39/4.
- NETS 212: Scalable and Cloud Computing (Fall 2016)
  85 students. Course quality: 2.94/4, Instructor: 3.00/4.
- CIS 455/555: Internet and Web Systems (Spring 2016)
  89 students. Course quality: 3.29/4, Instructor: 3.13/4.

- NETS 212: Scalable and Cloud Computing (Fall 2015)
  73 students. Course quality: 2.88/4, Instructor: 2.84/4.
- CIS 800/004: Beyond MapReduce (Spring 2015)
  14 students. Course quality: 3.67/4, Instructor: 3.67/4.
- CIS 455/555: Internet and Web Systems (Spring 2014)
  87 students. Course quality: 3.57/4, Instructor: 3.61/4.
- NETS 212: Scalable and Cloud Computing (Fall 2013)
  45 students. Course quality: 3.41/4, Instructor: 3.26/4.
- CIS 455/555: Internet and Web Systems (Spring 2013)
  92 students. Course quality: 3.45/4, Instructor: 3.29/4.
- MKSE 212: Scalable and Cloud Computing (Fall 2012)
  43 students. Course quality: 2.92/4, Instructor: 3.16/4.
- CIS 455/555: Internet and Web Systems (Spring 2012)
  88 students. Course quality: 3.45/4, Instructor: 3.19/4.
- MKSE 212: Scalable and Cloud Computing (Fall 2011)
  31 students. Course quality: 2.85/4, Instructor: 2.81/4.
- CIS 455/555: Internet and Web Systems (Spring 2011)
  51 students. Course quality: 3.14/4, Instructor: 3.17/4.
- CIS 399: Scalable and Cloud Computing (Fall 2010)
  11 students. Course quality: 3.36/4, Instructor: 3.45/5.
- CIS 700/003: Distributed Systems meet Social Networks (Spring 2010)
  16 students. Course quality: 3.27/4, Instructor: 3.53/4.

Teaching Assistant, Rice University

- COMP 421: Operating Systems (Spring 2005)
- COMP 529: Computer Networks (Fall 2004)
- COMP 421: Operating Systems (Spring 2004)

Teaching Assistant, University of Karlsruhe

- System Architecture (Fall 2002)
- Systems Design and Implementation (Summer 2002)
- System Architecture (Fall 2001)
- Proseminar Linux Internals (Fall 2001)
- Proseminar Linux Internals (Fall 2000)
- Proseminar Inside Windows NT (Summer 2000)

Advisees

Doctoral Advisees

- Arjun Narayan
  Thesis: “Distributed Differential Privacy and Applications” (2015)
  First employment: Cockroach Labs.
- Mingchen Zhao
  Thesis: “Accountability in Distributed Systems with Incomplete Information” (2016)
  First employment: Facebook.

- Antonis Papadimitriou
  Thesis: "Distributed Query Execution with Strong Privacy Guarantees" (2017)
  First employment: Intel.
- Ang Chen
  Thesis: "Secure Diagnostics and Forensics with Network Provenance" (2017)
  First employment: Assistant professor, Rice University.
- Yang Wu (co-advised with Jonathan M. Smith)
  Expected graduation: Fall 2017.

Doctoral Thesis Committees

- Ben Karel (2017)
- Chen Chen (2017)
- Behnaz Arzani (2017)
- Bongho Kim (2016)
- Mengmeng Liu (2016)
- Shaohui Wang (2015)
- Yifei Yuan (2016)
- Zhuoyao Zhang (2014)
- Andrew West (2013)
- Wenchao Zhou (2012)
- Svilen Mihaylov (2012)
- Sudeepa Roy (2012)
- Aaron Bohannon (2012)
- Nicholas Taylor (2010)

Master's Advisees

- Dhruv Arya
  Thesis: "Zodiac: A Control Plane for Nebula" (2013)
  First employment: LinkedIn
- Prakashkumar Thiagarajan
  Thesis: "Malware Detection with Accountability" (2012)
  First employment: Oracle

Master's Thesis Committees

- Hongbo Zhang (2013)
- Ruchir Jha (2010)

Undergraduate Projects

- Tanvir Ahmed, EAS 499 (2017)
- Ian Sibner, Quanze Chen, Evelyn Yeung, and David Xu, Senior Design (2016)
- Dhrupad Bhardwaj and Shreshth Khilani, Senior Design (2016)
- Shray Kapoor, EAS 499 (2015)
- Yang Lv, Independent Study (2015)

- Wing Li and Connie Yuan, EAS 499 (2014)
- Daniel Alfi, EAS 499 (2014)
- Joseph Chan, EAS 499 (2013)
- Anna Thalia Parks, EAS 499 (2013)
- Xiaofan Tong, Independent Study (2013)
- Roashan Ayene, EAS 499 (2012)
- Willy Huang, EAS 499 (2012)
- Xiaojun Feng, Independent Study (2012)
- Kirti Patodia and Danielle Jabin, EAS 499 (2011)
- Levi Thornton, VLST 395 (2011)
- Justin Broglie, CIS 497 (2010)
- Lauren Frazier, Independent Study (2010)

Advisee Awards

- Mingchen Zhao: Microsoft Research PhD fellowship, 2013
- Dhruv Arya: Departmental Master's Thesis Award 2012–2013
- Arjun Narayan: Yahoo! Key Scientific Challenges award, 2012
- Lauren Frazier: 2nd place in NSBE National Poster competition, 2010

Service

Departmental Service

- Co-director and Undergraduate Curriculum Chair, Singh Program on Networked & Social Systems Engineering (NETS), 2016 – present
- Faculty search committee, 2016/2017
- Master's admissions committee, 2016/2017
- Master's admissions committee, 2015/2016
- Faculty search committee (Systems), 2015
- Faculty search committee (Systems), 2014
- PlanetLab maintainer, 2014 – present
- Department chair selection committee, 2013
- Faculty search committee (Systems), 2013
- Faculty search committee (Systems), 2012
- Lecturer search committee, 2012
- PhD admissions committee, 2012
- PhD admissions committee, 2011
- PhD admissions committee, 2010

Workshop Organizer

- Co-Chair, 7th Workshop on Hot Topics in System Dependability (HotDep), 2011

Program Committee Member

- ACM Symposium on Operating Systems Principles (SOSP), 2017
- ACM SIGCOMM Conference (SIGCOMM), 2017
- ACM Symposium on Operating Systems Design and Implementation (OSDI), 2014
- USENIX Symposium on Networked Systems Design and Implementation (NSDI), 2015
- ACM European Conference on Computer Systems (EuroSys), 2018, 2016, 2015, 2012, 2011
- IEEE Symposium on Security and Privacy (Oakland), 2018, 2017, 2016
- ACM Conference on Computer and Communications Security (CCS), 2017
- ACM Symposium on Principles of Distributed Computing (PODC), 2017
- ACM Internet Measurement Conference (IMC), 2016, 2014
- USENIX Annual Technical Conference (ATC), 2016, 2012
- ACM Symposium on Cloud Computing (SoCC), 2015, 2013
- ACM Workshop on Hot Topics in Networks (HotNets), 2016
- ACM International Systems and Storage Conference (SYSTOR), 2016
- International Conference on Distributed Computing Systems (ICDCS), 2016, 2014
- USENIX Workshop on Cyber Security Experimentation and Test (CSET), 2016
- Workshop on Foundations of Computer Security (FCS), 2016
- Workshop on Hot Topics in System Dependability (HotDep), 2014, 2013, 2010
- ACM Cloud Computing Security Workshop (CCSW), 2014, 2013
- IRIS Student Workshop, 2004

Grant Proposal Reviewer/Panelist

- NSF: 7 panels, 1 ad-hoc review
- External Reviewer, National Fund for Scientific & Technological Development, Chile
- External Reviewer, Agency for Innovation by Science and Technology, Belgium
- External Reviewer, German Research Foundation (DFG)

Other committees

- IMC Best Paper Award committee, 2016
- AISP Technology & Data Security Expert Panel, 2016
- SIGOPS Dennis M. Ritchie Award selection committee, 2015
- OSDI poster committee, 2014
- EuroSys Best Paper Award committee, 2012
- SOSP Poster/WiP committee, 2011

Journal Reviewer

- ACM Computing Surveys (CSUR)
- ACM Computer Communications Review (CCR)
- IEEE Transactions on Dependable and Secure Computing (TDSC)
- IEEE Transactions on Parallel and Distributed Systems (TPDS)
- IEEE Transactions on Computers (TC)

Patent applications

1. A. Chen, H. Xiao, W. Moore, **A. Haeberlen**, L. T. X. Phan, M. Sherr, and W. Zhou. *Methods, Systems, and Computer Readable Media for Detecting Covert Timing Channels.* U.S. patent application 62/059,503; filed Oct. 3, 2014. 46 pages.
2. **A. Haeberlen**, A. Ladd, D. Wallach, E. Flannery, A. Rudys, and L. Kavraki. *System and Method for Localization over a Wireless Network.* U.S. patent application 11/180,030; filed Jul. 12, 2005. 11 pages, 33 citations.
3. **A. Haeberlen**. *Method and System for Packet-Level Routing.* U.S. patent application 10/456,651; filed Jun. 6, 2003. 11 pages.